

Unbundling and Measuring Tunneling

Vladimir Atanasov, William and Mary
Bernard Black, Northwestern Univ.
Conrad Ciccotello, Georgia State Univ.

CUHK Law School, May 27, 2015

Hong Kong SFC, May 27, 2015

What is “Tunneling”?

- Generic term for variety of strategies
 - For insiders to extract more than pro-rata share of firm value
- **Not** same as “private benefits of control”
 - Non-pecuniary private benefits \neq tunneling
- **Not** “expropriation”
 - Whether minority shareholders are cheated depends on the price they paid
 - Expected tunneling \rightarrow lower share prices

Talk based on

- Vladimir Atanasov, Bernard Black and Conrad Ciccotello, *Unbundling and Measuring Tunneling*, 2014 **University of Illinois Law Review** 1697-1738 (<http://ssrn.com/abstract=1030529>)
- Vladimir Atanasov, Bernard Black and Conrad Ciccotello, *Law and Tunneling*, 37 **Journal of Corporation Law** 1-49 (2011) (<http://ssrn.com/abstract=1444414>)

Four Main Types of Tunneling

- Cash flow tunneling
 - transfer pricing
 - excess (recurring) insider compensation
- Asset tunneling “out” (asset stripping)
- Asset tunneling “in” (overpay for assets)
- Equity tunneling
 - dilution
 - Including excessive equity-based compensation
 - Freezeout minority shareholders
- Mixed types
 - loans to insiders (not repaid in bad states of world)

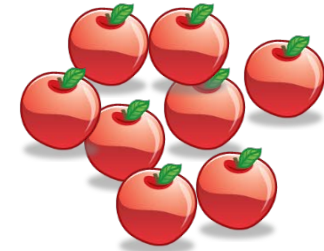
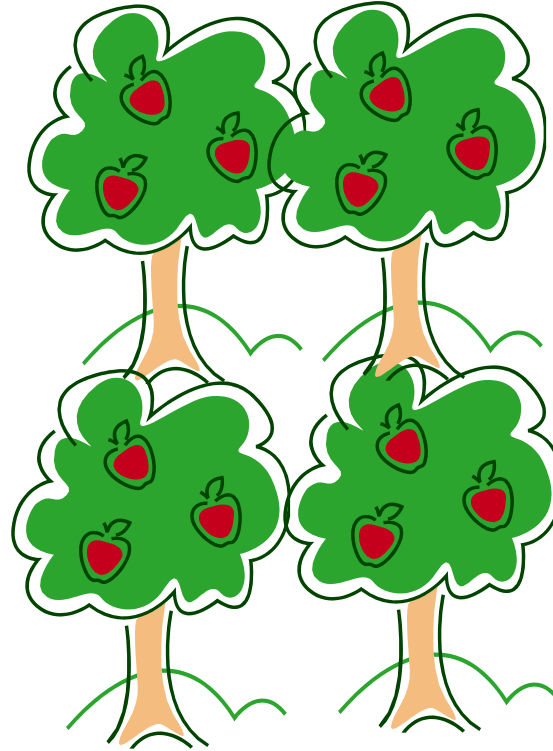
Equilibrium Model of Tunneling

- Investors pay fair price on average
 - But not in each case
 - Leads to adverse selection
 - Overpay if tunneling occurs
 - Underpay if it does not
 - Controller incentives to tunnel ex post
 - Especially if weak disclosure
- Different tunneling types affect different financial metrics
- Illustrate model with case studies: Coke, Gazprom
- Tunneling risk as asset pricing factor

Guidance for Investors; Role of Regulation

- guidance for investors, researchers, advisors:
 - how to use financial metrics to assess tunneling risk
 - impact on share values
 - Tunneling risk as asset pricing factor
- guidance for regulators
 - what disclosures would help investors assess tunneling events
 - Better disclosure → weaker tunneling incentives
 - reforms to limit tunneling
- Different laws/rules limit each type of tunneling
 - US not very strong
 - Anti-tunneling culture works at most firms, but not all
 - Hong Kong?

Tree Grove Analogy



Fruit Growers Company

Equity Tunneling

Asset Tunneling

Cash Flow Tunneling



Controllers, Co.

Impact on Share Value

- Simple, algebraic model
- Goal: High ratio of intuition to algebra
- Assume zero-growth, no taxes, no debt,
- Cost of capital K_0 (w/o tunneling)
 - first order = indep. of tunneling risk
- “Intrinsic” value, no tunneling:

$$IV_{no-tun} = \frac{EBIT}{\text{cost of capital}} = \frac{ROA_0 * A_0}{K_0}$$

Cash-flow tunneling

- Controller diverts fraction d_{cf} of EBIT (steady state)
- Share price drops by factor $(1 - d_{cf})$

$$MV_{0,CF\ tun} = \frac{(1 - d_{cf}) * ROA_0 * A_0}{K_0}$$

- **Transfer pricing:**
 - depresses gross margin (sales-COGS)/sales **and** operating margin (EBIT/sales)
- **Excess executive comp, Non-operating services (G&A)**
 - depresses only **operating margin**
- **Both types:**
 - **Reduce** ROA (EBIT/assets), Tobin's q (MV/assets)
 - **No direct effect** on P/E: similar effect on both P and E

Expected *future* asset tunneling (in or out)

- Combined effect of probability and magnitude
 - probability = $\pi_{a,pre}$; fraction of value = d_a
 - lower post-tunneling value of remaining assets (lose synergy) = factor $(1-d_{syn})$

$$MV_{0,asset\ tun} = \frac{(1 - \pi_{a,pre} d_a) * (1 - \pi_{a,pre} d_{syn}) * ROA_0 * A_0}{K_0}$$

- **Affects:** metrics based on price (P/E, q)
- **Doesn't affect:** financial statement metrics
 - Hasn't happened yet

Realized asset tunneling

- Expected future probability and discount change [d becomes d']
- ROA_1 and A_1 incorporate past tunneling

$$MV_{1,asset\ tun} = \frac{(1 - \pi_{a,post} d'_{syn}) * (1 - \pi_{a,post} d'_a) * ROA_1 * A_1}{K_0}$$

- Effect on metrics

Metric	Asset tunneling “out”	Asset tunneling “in”
P/E; Tobin’s q	Tends to decline	Tends to decline
Gross margin	No direct effect	No direct effect
Operating margin (EBIT/sales)	No direct effect	Lower margin on new sales (higher depreciation)
EBITDA/sales	No direct effect	No direct effect
ROA (EBIT/assets)	falls: EBIT drops more than assets	falls with dual impact: Lower margin, higher assets
Asset turnover (sales/assets)	Declines	Declines

Expected *future* equity tunneling

- probability = $\pi_{eq, pre}$; fraction of value = d_{eq}
 - equity dilution: assume (for simplicity) firm issues new shares to insiders for zero price

$$MV_{0,eq\ tun} = \frac{(1 - \pi_{eq,pre} d_{eq}) * ROA_0 * A_0}{K_0}$$

- ***Affects***: metrics based on price (P/E, q)
- ***Doesn't affect***: financial statement metrics

Realized equity dilution

- Expected future probability and discount change

$$MV_{1,tun} = (1 - d_{eq}) \frac{(1 - \pi_{eq,post} d'_{eq}) * ROA_0 * A_0}{K_0}$$

- Still no effect on financial statement metrics
- Past dilution: no **direct** effect on *cost of equity* or P/E
 - P/E: More shares → Lower P, lower E
 - P affected by expected future dilution
 - Cost of equity = inverse of P/E

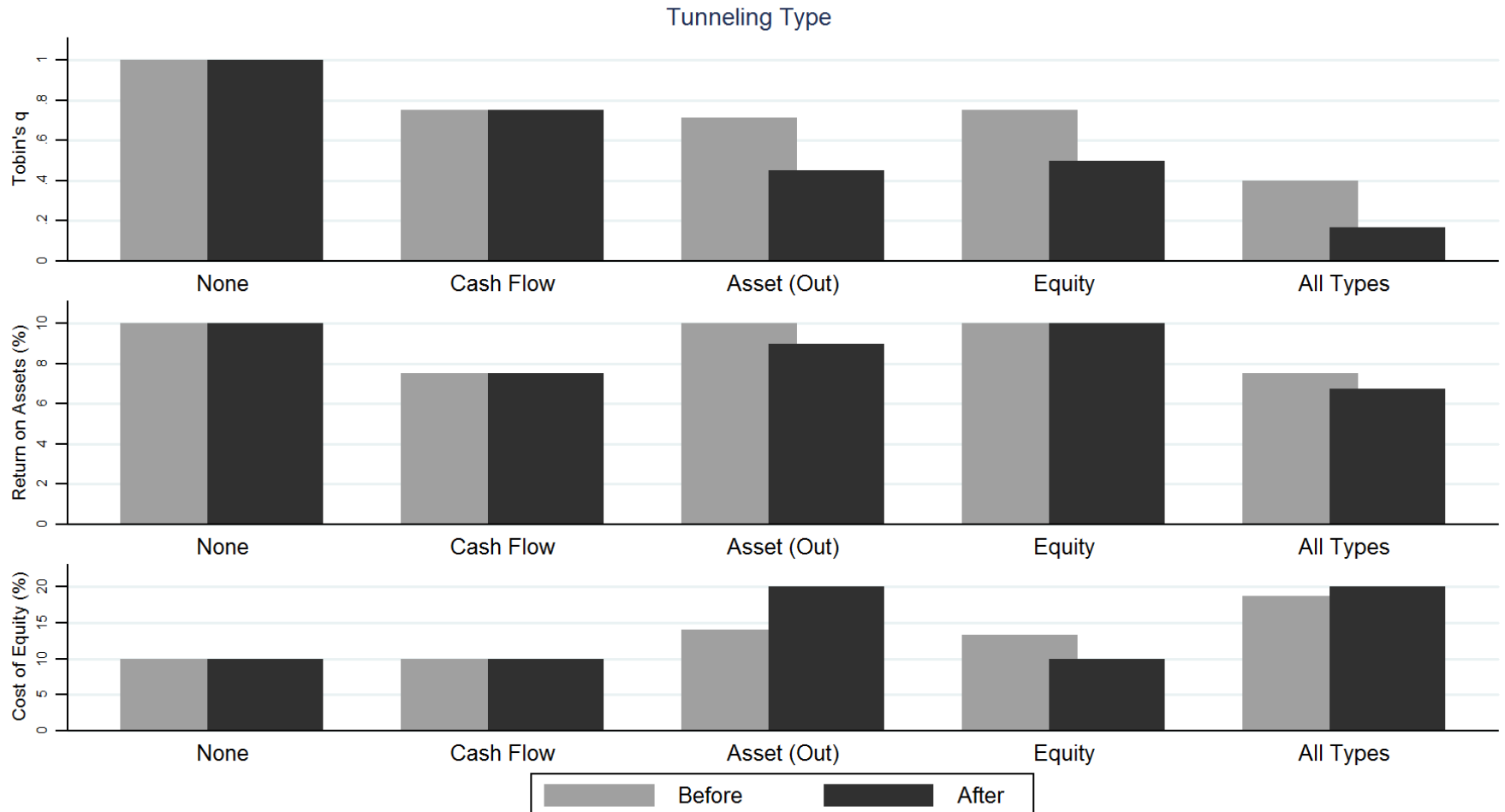
Equity tunneling even if pay market price

- Market price reflects all tunneling risks:

$$MV_{0,tun} = \frac{(1 - d_{cf})(1 - \pi_{a,pre} d_{syn})(1 - \pi_{a,pre} d_a)(1 - \pi_{eq,pre} d_{eq}) * ROA_0 * A_0}{K_0}$$

- Implication of tunneling risk
 - freezeout or equity sale **at market** can be dilutive
 - freezeout or sale at discount to market: double hit
 - insiders can manipulate price (through trading, disclosure)
 - asset sale to insiders can be dilutive if value estimated from market value of shares
 - hence can't base appraisal remedy solely on market price

Tunneling and Metrics: An Illustration



$A_0=1$, $ROA_0 = 10\%$, $K_0 = 10\%$, $d_{cf} = 0.25$, $d_{eq}=d_a=\pi_{eq} = \pi_a = 0.5$ $d_{syn} = 0.1$
 post-tunneling probabilities of further tunneling= 0

Extend to infinite time

Start with formula above:

$$MV_0 = \frac{(1 - d_{cf})(1 - \pi_{a,pre} d_{syn})(1 - \pi_{a,pre} d_a)(1 - \pi_{eq,pre} d_{eq}) * ROA_0 * A_0}{K_0}$$

Ignore synergy, add growth, let $\pi_a d_a = \delta_a$, $\pi_{eq} d_{eq} = \delta_{eq}$, sum over $t=(1, \infty)$

Similar to standard compound (Gordon) growth model) :

$$MV_0 = [ROA_0 * A_0 * (1 - d_{cf})] * \left[\frac{1}{(K_0 - g + \delta_{eq} + \delta_a + (\Sigma(\text{interaction terms})))} \right]$$

$$= CF_0 * \left[\frac{1}{(K_0 - g + K_{tun})} \right]$$

$$K_{tun} = [\delta_{eq} + \delta_a + \Sigma(\text{interaction terms})]$$

$$\text{interaction terms: } [- (d_{eq} * d_a) + (d_{eq} * g) + (d_a * g) - (d_{eq} * d_a * g)]$$

$\delta_{eq} + \delta_a$ look like asset pricing factors

Tunneling and classic asset pricing factors

- $\Delta K_{\text{tun}} \rightarrow \Delta(\text{price})$
- Which standard asset pricing factors are likely to be correlated with K_{tun} ?
 - β , momentum = no obvious connection
 - size: larger firms more visible \rightarrow higher tunneling cost \rightarrow less tunneling (% of $MV_{\text{no-tun}}$)
 - market/book: responds directly to tunneling risk
- So, tunneling risk will load on size and M/B
 - Will look like (and contribute to) these classic factors
 - New explanation for size, M/B factors!

Case studies: Gazprom

- Gazprom is great fun
 - raw tunneling
 - one transaction alone: gas field worth > \$400M (per PWC) sold to Itera for \$1,200
 - PWC “could not confirm” who owns Itera
 - huge dollars
 - one estimate: total transfers to Itera = \$30B
 - double discounts
 - insiders bought Gazprom shares in 1990s from gov’t at discounts to already hugely discounted market prices
 - market value/(barrel of reserves) = \$0.026 in 1999
 - up 50-fold to \$1.40 by 2008
 - still only 10% of Western multiples

Coke and Coke Bottling (1986-2008)

- Coke spins off Coke Bottling -- IPO in late 1986
 - Coke keeps 49%
 - Coke-affiliated directors control Bottling board
 - Coke deconsolidates Bottling (claims no control!?)
- Asset tunneling “in” (to Bottling)
 - Coke sells bottling plants to Bottling
 - prices far above book value
- Bottling pre-tax cost of capital \approx 8-9%
- 1990 = last year in which Bottling had 7% ROA
 - since then, 4%-6% (worst under Goizueta, thru 1996)
 - miserable share price performance
 - (very) overcompensated CEO

Was there tunneling, and what kind?

Financial Metrics, 1987-1996	Bottling Mean	Peers Mean	Prob. (equal means)
Gross Margin	0.463	0.372	0.006
(Depreciation and Amortization)/sales	0.069	0.044	0.000
Operating Margin (EBIT/sales)	0.075	0.090	0.040
EBITDA/assets	0.101	0.139	0.000
ROA (EBIT/assets)	0.053	0.095	0.007
Other Long-Term Assets (Intangibles)/ Total Long-Term Assets	0.728	0.392	0.000
Tobin's q	1.248	1.642	0.274
Price/Earnings	44.503	29.206	0.008

No evidence for cash flow tunneling

Strong evidence for asset tunneling "in": Bottling overpays Coke for bottling plants

Best available peers: four firms, one Canadian, 3 affiliated with Pepsi

Summary: Asset Tunneling In

- Over time, Coke sells bottling assets to Coke Bottling
 - \uparrow (assets), \uparrow (D&A) \rightarrow $\downarrow\downarrow$ ROA
 - by 2001: \$6B goodwill out of \$8.6B total Bottling assets
- For normal ROA (0.07), Bottling needed to pay \$5B less!
- Minimal Disclosure
 - “Bottling bought plant X from Coke for \$Y”
 - sometimes omits assumed debt, which is most of purchase price
 - Later -- “Total asset purchases from Coke since IPO are \$Z”
 - With current disclosure rules: only way to detect asset tunneling is indirect . . . and slow (emerges over time_)
 - Excess D&A
 - suppressed ROA
- Shareholder suits claiming tunneling failed.

Payoffs from Project

- Payoffs from effort to unbundle, measure tunneling:
 - Guide to tunneling research
 - Asset pricing implications
 - Policy implications:
 - even in US, large scale tunneling can be minimally disclosed
 - goal of financial reporting: Tell investors what they need to know to value firms
 - for tunneling, long way to go

Tunneling Disclosure

- Predict: Better disclosure → less tunneling
 - Won't help for freezeouts
- How to test?
 - Run equivalent of drug trial
 - Randomize firms into treated, controls
 - Require treated firms to disclose [whatever] for say 5 years.

Near-term Effects

- Event study of investor reaction when treated and control firms are disclosed
 - With longer term followup to see if investors are right
 - If event study is clear enough, can extend to all firms, without waiting for experiment to end
- With sufficient sample, can study range of “treatments”
 - Can run multiple studies in parallel

Shareholder voting rules

- Minority shareholder approval for suspect classes of transactions
 - Majority vs supermajority
 - Layered approval
 - Independent directors first
 - They can negotiate
 - Some will be truly independent, others won't be
 - Followed by minority shareholder vote

Voting rights experiments

- Can run experiments here too
 - Study value of voting rights
 - Shares versus options using put-call parity
 - Prospective
 - And retrospective, for past events

Big picture idea

- To achieve world-class securities regulation
 - Don't just guess
 - Or copy others, like the US
- Experiment!

If you are interested . . .

- Come talk to us!
- We can help with research design
- Made similar pitch to US SEC
 - At least to the economists
 - Not sure they are listening